

Environmental Science

CALCIUM DIFFUSION IN ECOLOGICAL SYSTEMS, Molly J. Andreason, Paul R. Ohmann*, University of St. Thomas, Department of Physics, 2115 Summit Avenue, St. Paul, MN 55105, prohmann@stthomas.edu

Acid rain is an environmental problem that has garnered international attention for the past 30 years. One problem it causes is depletion of calcium in forest systems, leading to a decrease in soil pH levels. This has resulted in great losses of vegetation in some areas. However, not all regions have been strongly affected by calcium depletion; some have appeared to find alternative sources of calcium to counter these losses. One hypothesis is that calcium may be replenished through diffusion from underground sources. Our research shows a consistency between the concentration of calcium in the soil at Walker Branch Watershed (WBW) in Tennessee and the replenishment of lost calcium via diffusion from the underlying bedrock. We constructed a computational model of calcium diffusion to model the WBW system; results include an estimate of the upward calcium transport of 6.5 kg/ha/yr at the soil surface through diffusion from bedrock 20 meters underneath.